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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,159	06/24/2003	Robert J. Curran	POU920030019US1	9989

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EXAMINER	
PATEL, HETUL B	

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/602,159	CURRAN ET AL.	
	Examiner	Art Unit	
	Hetul Patel	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the amendment filed on July 17, 2006. This amendment has been entered and carefully considered. Claims 1, 6-7 and 11-13 have been amended and claim 14 is newly added. Claims 1-3 and 5-14 are now pending in this application.

2. Applicant's arguments filed on July 17, 2006 have been fully considered but they are not deemed to be persuasive.

3. The rejection of claims 1-3, 5-6 and 11-13 as in the previous Office Action mailed is respectfully maintained and reiterated below for Applicant's convenience.

Claim Objections

4. Claim 7 is objected to because of the following informalities:

The phrase "writing to a backup file ... that contain new data" is not clear.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-3 and 5-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added subject matter in claims 1, 6-7 and 11-13, i.e. the write request providing the capability for application programs to determine changes to the file by an incremental read of only blocks of the file that contain new data, is not clear in the application as filed. Although Applicant pointed out in the remarks submitted on July 17, 2006 that paragraphs [0057], [0060], [0063], [0065] and [0067] of the current application discloses about reading *the data* of only those blocks of the file that contain new data since last backup, however, the *metadata* (i.e. the dirty bit) of each block needs to be read to determine whether the block contains new data or not. Therefore, claims needs to be amended to more clarify the concept, i.e. the phrase "an incremental read of only blocks of the file that contain new data" of claim 1 (and other similar claims) may need to be changed with the phrase "an incremental read of **the actual data other than the metadata of** only blocks of the file that contain new data" or some similar language. Claims 2-3, 5, 8-10 and 14 are also rejected as they depend upon the rejected base claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 5-6 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanfi (USPN: 5,559,991).

As per claim 1, Kanfi teaches a method for tracking incremental backup operations for changes to a file, especially for a large and/or sparse file, for efficient backup thereof, said method comprising the steps of: backing up said file to create a backup copy of said file; processing a write request relevant to at least one block of said file by storing changes in information for said file and by providing an indication that information stored in said at least one block of said file is new data, the write request providing the capability for application programs to determine changes to the file by an incremental read of only blocks of the file that contain new data (e.g. "A facility is provided for storing in a backup memory only those blocks of a file, or disk partition, which differ from corresponding blocks forming an earlier version of the file" see the abstract); and backing up said file using at least one select block having said indication that information stored in said at least one block of said file is new data (e.g. see the abstract, Col. 4, lines 49-67 and Figs. 3 and 5). Furthermore, Kanfi teaches that the backing up of at least one select blocks is further determined based on a time stamp, i.e. the time stamp 2 (i.e. 501 in Fig. 5) associated with the current/latest version of the block, associated with said at least one block (e.g. see the abstract, Col. 4, lines 49-67 and Figs. 3 and 5).

As per claims 11-13, see arguments with respect to the rejection of claim 1. Claims 11-13 are also rejected based on the same rationale as the rejection of claim 1.

As per claim 2, Kanfi teaches the claimed invention as described above and furthermore, Kanfi teaches that the indication, i.e. the signature of the block/file, is stored in inode data for said file (e.g. see Col. 1, lines 33-40).

As per claim 3, Kanfi teaches the claimed invention as described above and furthermore, Kanfi teaches that the indication is stored in indirect blocks, i.e. the blocks those are changed/modified since the last backup or those blocks whose signatures differ from signatures generated, referenced by inode data for said file (e.g. see Col. 8, lines 22-40).

As per claim 5, Kanfi teaches the claimed invention as described above and furthermore, Kanfi teaches that the backing up of at least one select blocks is further determined based on two time stamps, i.e. the time stamp 1 (i.e. 301 in Fig. 3) associated with the older version of the block when it last backed up and the time stamp 2 (i.e. 501 in Fig. 5) associated with the current/latest version of the block, associated with said at least one block (e.g. see the abstract, Col. 4, lines 49-67 and Figs. 3 and 5).

As per claim 6, Kanfi teaches a method for performing block level incremental backup operations for a file using two time stamps as described in Col. 4, lines 49-67 and Figs. 3 and 5. The feature of, retrieving incremental changes to backed up block level data by providing two time stamps to a file system in a read request; and returning information with respect to changes in said block made between times indicated by said two time stamps, is also inherently embedded in the file system taught by Kanfi.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar (USPN: 2004/0158730) in view of Kanfi.

As per claim 6, Sarkar teaches a method for retrieving incremental changes to backed up block level data, especially from large and/or sparse files, each file comprising plurality of blocks, said method comprising the steps of: providing two time stamps (the current PiTC and earlier PiTC) to a file system in a read request; and returning information with respect to changes in said blocks made between times indicated by said two time stamps, i.e. returning only deltas between the current PiTC and earlier PiTC (e.g. see step 220 in Fig. 2 and the abstract and paragraph [0073]). However, Sarkar does not teach that the write request providing the capability for application programs to determine changes to the file by an incremental read of only blocks of the file that contain new data. Kanfi, on the other hand, teaches that the write request providing the capability for application programs to determine changes to the file by an incremental read of only blocks of the file that contain new data (e.g. "A facility is provided for storing in a backup memory only those blocks of a file, or disk partition, which differ from corresponding blocks forming an earlier version of the file" see the abstract). Accordingly, it would have been obvious to one of ordinary skilled in

the art at the time of the current invention was made to implement Kanfi's teachings in the method taught by Sarkar. In doing so, (i) the backup process will be faster and more efficient since only the new data would be backed up instead of the whole file; and (ii) the storage space of the backup storage will be reduced since only the new data will be backed up.

8. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura et al. (USPN: 5,720,026) hereinafter, Uemura in view of Bolosky et al. (USPN: 6,513,051) hereinafter, Bolosky.

As per claim 7, Uemura teaches a method for backing up sparse files, said method comprising the step of: writing to a backup file in a write request to a file system in which at least one user specified portion of said file is defined to have a specified value and in which the size of said at least one portion is specified by said user (e.g. see the abstract and Col. 11, lines 34-49). Uemura further discloses in the abstract that the backup data includes data in a block of the storage unit which is updated in a specified backup generation based on the difference map information, a position of the block in the storage unit, and a backup generation in which the block has been updated, i.e. the write request providing the capability for application programs to determine changes to the file by an incremental read of only blocks of the file that contain new data (e.g. see the abstract).

However, Uemura does not teach about the incremental read of said file returning an indication of a hole for each portion of the file not containing data specified

by said user, such that said write request inserts holes into said backup file, thereby bringing said backup file up to data. Bolosky, on the other hand, teaches that a hole (i.e. unallocated) is inserted in the backup file for each portion of the sparse file not having data (e.g. see Col. 6, lines 17-22). Accordingly, it would have been obvious to one of ordinary skilled in the art at the time of the current invention was made to implement Bolosky's teachings in the method taught by Uemura. In doing so, when the data is retrieved from the backup file, all the data including the zero and non-zero data can be retrieved back.

As per claim 8, the combination of Uemura and Bolosky teaches the claimed invention as described above and furthermore, Uemura teaches that there are a plurality of said portions, i.e. one or more backup generations specified by the user input (e.g. see Col. 11, lines 34-49).

As per claims 9 and 10, the combination of Uemura and Bolosky teaches the claimed invention as described above and furthermore, Uemura teaches about the specified value, i.e. a latest backup generation number included in the block for referencing a generation in which data has been updated in the block (e.g. see the claim 1). Since neither applicant nor specification disclose changing the specified value would change the system functionality or performance, therefore, any specified value including zero or any other predetermined value can be used, by this rationale, claims 9 and 10 are rejected.

Remarks

9. As to the remark, Applicant asserted that

(a) Although Kanfi only stores the blocks of a file that have changed, Kanfi must generate a table of data signatures associated with the entire file, which must be stored and read before storing the changed blocks. This is in contrast to the Applicants' ***incremental reading***, as recited in the claims.

(b) The current invention (i.e. reciting in the claims as amended ***"to determine changes to said file by an incremental reading of only blocks of said file that contain new data"***) avoids the drawbacks of using heuristic data signatures, as Kanfi does, which must be stored or generated with each backup, and which still require the reading of an entire file as explicitly pointed out by Applicant in the specification.

(c) Uemura do not deal in any way with specific handling of holes in sparse files. In other words, Uemura do not teach or suggest an incremental read of a file ***"returning an indication of a hole for each portion of the file not containing data specified by said user, such that said write request inserts holes into said backup file, thereby bringing said backup file up to date"*** as claimed in claims 7-10.

(d) The current application claims for "***an incremental read of*** only the changed data" while the Kanfi reference teaches about "***storing*** only the changed data" without reference to how data is read and compared by Kanfi.

Examiner respectfully traverses Applicant's remark for the following reasons:

With respect to (a)-(b) and (d), Examiner agreed with Applicant that Kanfi must read the table of data signatures associated with entire file and then, storing only those blocks of the file that have changed, i.e. blocks whose signature doesn't match with the signature of blocks that have been already archived (e.g. see Col. 3, lines 38-50). However, this is similar to reading the metadata (i.e. the dirty bit) associated with each block of the file and then archiving only those blocks which contain new data in the current invention.

With respect to (c), Bolosky is teaching this limitation as described above in rejection of claim 7.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Tanaka et al. (USPN: 5,321,832) also teaches about reading the data of only those blocks/portions which are updated based on the indications recorded in the control memory (e.g. see Col. 1, lines 20-40).

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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